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Inconsistency of tests based on extremal values

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Abstract

© 2016, Pleiades Publishing, Ltd.The goal of this article is to show, that quality control based on extremal observation values is inconsistent in situations, when quality of statistical procedure is the average error rate of those experiments which ended with the adoption of some decision. Thanks to L.N. Bolshev this concept of risk procedures was introduced in the 70s–80s of the last century (see [1, 2], where such risk was called d-posteriori). In this article we analyze two probabilistic models, in which distributions of observations and output parameter are exponential. Using the asymptotic analysis methods of Laplace integrals we can show, that values of d-posteriori probabilistic errors do not reach arbitrary limitation for the procedure based on the first (last) order statistics.

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Keywords

inconsistency, order statistics, Quality control